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FLEETING AMAUROSIS IN INFANTS PRESENTING SYMPTOMS OF MENINGITIS.

By SYDNEY STEPHENSON, C.M.

That infants suffering from meningitis often lose their sight is, of course, a fact known to every student, and it is duly set forth in every text-book of medicine. Indeed, the examination of the eyes with the ophthalmoscope is nowadays rightly regarded as an essential item in the physical investigation of every case where meningitis is suspected. In many of the patients examination reveals a papillitis, which may be followed at a later stage by atrophy of the optic disc, and presumably also of the optic nerve.

There exists, however, a type of case which is less common, where during the course of a cerebral attack sight appears to be altogether lost without ophthalmoscopic signs of either papillitis or atrophy, and the particular interest of such cases lies in the fact that the children often recover both sight and health at a later period. My inquiries lead me to believe that this "fleeting amaurosis" is not so generally recognised by physicians as it might be—an omission the more curious seeing that its essential features have been worked out

by several observers, notably by Mr. Edward Nettleship* and by Dr. William Gay,† who have published excellent descriptive papers upon the subject.

In my own experience of these cases the patients are usually below two years of age. There is a history of recent illness, marked by retraction of the head, fits, twitchings, drowsiness, stupor, rigidity, vomiting, bulging of the anterior fontanelle, headache, and perhaps other symptoms suggestive of an inflammation of the meninges of the brain. The temperature may be of distinctly febrile type. Obstinate constipation is sometimes present, although that is by no means the rule. At some period during the illness (which, as a rule, runs a chronic course) the mother finds that her baby ceases to take notice of things and to recognise familiar objects. The loss of sight usually appears to be complete, and, as far as can be made out, comes on almost suddenly. At this stage the pupils, in my experience, are larger than normal, and possess little if any direct response to light; but beyond that I have never succeeded in obtaining any objective evidence of organic changes in the eyes. In the further course, cerebral symptoms pass away, and the child slowly regains its health. Sight gradually returns, at first for large and bright objects, but later for things even so minute as pins lying upon the floor of a room. The ophthalmoscopic appearances, as might be expected, are then negative. The pupils react well to light.

That a simple basal meningitis existed in most of the cases was the opinion held both by myself and by the physicians in more direct charge of the patients. Such, in brief, are the essential features of what Dr. Gay has proposed to call the "acute cerebral amaurosis of infancy," than which it would, I venture to think, be difficult to find a better descriptive name.

It is impossible to doubt that such cases form a definite

* Nettleship, 'Trans. Ophthal. Society,' vol. iv (1884); 'Roy. Lond. Ophthal. Hospital Reports,' vol. xi (1887), p. 353.

† Gay, 'Roy. Lond. Ophthal. Hosp. Reports,' vol. xiii (1893), p. 404.

group, the existence of which can scarcely be too widely known. I have notes of six such cases, and I will detail briefly four of them that I have been enabled to follow up more closely than the others. In doing this I should wish to thank Dr. George Carpenter and Dr. J. H. Sequeira, under whose care some of my patients originally were, for permission to publish the cases.

Case 1.—Henry K—, aged 7 weeks, was brought to me at the Evelina Hospital on July the 26th, 1901, with the statement that he had lately lost his sight. The child, who was breast-fed, had suffered from vomiting for three weeks and from diarrhœa for a few days. His head was markedly retracted, and this was said to have come on two or three days after the sickness began. The pupils were equal and reacted to light; there was no squint. The optic discs and retinal vessels showed no changes, but the baby certainly appeared to be blind, since it took no notice of a bright light. A maternal aunt had died of phthisis.

August the 2nd.—The baby had several "convulsion fits" soon after leaving the hospital a week ago, and these have been repeated in the interval. He still vomits.

9th.—Although the head is still retracted, the child seems better in himself, and the vomiting has almost stopped. He notices nothing, but the fundi oculorum still show no ophthalmoscopical changes.

23rd.—The sickness has almost stopped, and the child is putting on flesh. The neck is no longer stiff. The pupils are equal, of medium size, but with little reaction to light. The patient recognises his mother when she comes into the room.

September the 20th.—The child now "coos" when his mother comes into the room, and notices things generally. His sight is said to improve daily. The pupils are equal, and act better to light. The fundi oculorum are as at the

first observation. His general health appears to be now satisfactory.

Case 2.—Nellie A—, born on April the 19th, 1900, was sent to me by Dr. George Carpenter at the age of about one year (March the 29th, 1901). The history given by the mother was that until Christmas, 1900, the baby was "a pretty little child, quite good and sharp," but that she then developed "congestion of the lungs and bronchitis," and that this was followed by "fits" (seventeen in twenty-four hours). During these fits the sight failed. A private doctor is said to have diagnosed "meningitis" and "water on the brain." The baby did not cry, but lay unconscious for about six weeks. The mother thinks that the baby was blind until the last two or three days, but says that she now appears to notice a little. A brother, a sister, and two cousins of the patient's father have been, or now are, in asylums for the insane.

Upon examination, the pupils were found to be of medium size with little direct action to light. The baby did not follow or notice a light, and seemed to be blind, but the optic disc, yellow spots, and retinal vessels showed no morbid changes.

May the 24th.—Three days ago—that is fifty-three days after I first examined the child—she was noticed to turn her eyes up when the mother approached the cot without noise, and since then she is said to have looked about her in a dazed and nervous sort of way. She has not yet recognised anybody. The mother herself is now convinced that the baby sees a little. The pupils are semi-dilated; the fundi oculorum are normal.

31st.—The mother is satisfied that the baby's sight is slowly returning. The pupils remain of medium size and motionless.

July the 12th.—The child is stated to lose consciousness, and to lie for two hours at a time prostrate. This has happened five times during the present month. She

seems to have pain in her head, and "tears, and scratches, and screams." She does not sleep well. She vomited whilst in the out-patient room. She grasps at a gold watch held before her.

August the 9th.—Since her last visit she has suffered from diarrhœa and vomiting. She now obviously takes notice of things, plays with her toys, and recognises her friends. The mother thinks, however, that the sight is still peculiar, as it seems to "fade away" when the baby is poorly. The pupils are equal (2·5 mm.), and react, although not very vigorously, to light. The child notices things at once, and follows them with her hands. She is now sixteen months old. Under chloroform the fundi oculorum were examined thoroughly, but with negative results.

October the 4th.—The infant is now fat, and well in general health. She is restless, always turning and twisting about upon her mother's lap. She often holds her head with her hands. She is stated never to be asleep, and always to be "grizzling like a pigeon cooing." She can sit up, but cannot crawl. She knows her mother and everybody around her, and plays with her toys as a child should do. She is not deaf. The pupils react to light. The fundi oculorum (examined under chloroform) show no changes, the discs are of good colour, the vessels normal, and there are no changes in the yellow-spot regions. Dr. George Carpenter, who saw the case a few days later, thought that she was mentally afflicted.

The next case is of unusual interest, owing to the fact that, although the blindness disappeared, a paresis of one of the extrinsic muscles of the eyeball remained as permanent evidence of the meningitic attack.

Case 3.—Sylvia C—, aged 8 years, was brought to me on July the 19th, 1898, because she squinted, looked sideways at her book, and was said to go downstairs "like an old woman." According to the clear history given, the child when about six months old had a bout of vomiting,

which was put down to "teething." At nine months of age, however, sickness recurred, and was followed by muscular twitching, retraction of the head, and failure of sight. For eleven days her temperature ranged between 97° F. and 101° F., but was above normal nearly the whole time. Before that the temperature had reached 103·4° F. on two occasions. There was defective vision, conjugate deviation downwards, and rolling of the head, and it was noted that the dilated pupils reacted feebly to light. The ailment was diagnosed as *tuberculous meningitis* by the physicians in charge, and it was thought by them that the patient could not possibly get well. But, to everybody's astonishment, improvement set in and sight returned. There was, it appears, a relapse, and sight again failed, so that the child is said once more to have become perfectly blind. After the lapse of three or four months the baby was observed to pick bits off her mother's dress, and soon after that is stated to have seen as well as anybody else. There was no phthisis on either side of the family. The patient was the ninth of ten living and healthy children.

On examination, I found there was a paresis of the internal rectus of the left eye, causing an outward squint of 35°—40°. With spectacles the sight of the right eye was normal, and that of the left one-third normal. The pupils were equal and active. The fundi oculorum showed no changes, the optic discs were of good colour, and the retinal vessels normal.

Case 4.—Martha F—, 15 months old, was first seen on April the 22nd, 1901. The child was taken ill three weeks previously, when she had a "fit" and was drowsy for a couple of days. She vomited at the time of the "fit," but has not done so since. The bowels have been loose and the motions offensive. The paternal grandmother died of phthisis. There are five other children in the family, all healthy. *Upon admission,* the child was drowsy, with slight retraction of the head. The anterior fontanelle was much bulged; the reflexes exaggerated. There was

neither squint nor optic papillitis. The temperature was 100° F. She weighed 16¾ lbs. A diagnosis of posterior basic meningitis was made by Dr. J. H. Sequeira, under whose care the child was admitted into the North-Eastern Hospital for Children.

April the 29th.—The child is sick three or four times a day. The drowsy condition persists; the anterior fontanelle is still much bulged. The temperature ranges from 97° F. to 100·8° F.; the pulse varies from 76 to 152 beats a minute; and the respirations from 28 to 36 times a minute. The bowels tend to be costive.

May the 3rd.—Vomiting has ceased. The temperature has risen to 101° F., the pulse-rate to 140 per minute, and the respirations to 36 per minute.

10th.—Sickness recurred on May the 7th, and the child has vomited once a day since that date. During the last five days the anterior fontanelle has gradually become less prominent, and is now, if anything, depressed. The temperature has not risen above 99·6° F. since the last note.

17th.—To-day *the child recognised* and talked to her parents when they visited the hospital.

24th.—The temperature has risen once only (101° F.) since the last note. The child is more fretful, and the anterior fontanelle is more prominent. The reflexes are brisk, but the knee-jerks are obtained with difficulty.

30th.—The pupils are dilated and do not respond to light, and the patient is apparently unable to see.

June the 6th.—The child takes no notice of anything, and appears to be quite blind. The pupils do not react to light; the fundi oculorum show no changes.

15th.—The child was discharged from the hospital, seemingly quite blind. The temperature has been normal since the 1st of June. She weighed 16¾ lbs. Medicinal treatment has consisted of the administration of mercury with chalk, in half-grain doses thrice a day, and later of cod-liver oil. The diet has included milk, whey, virol,

cream, and orange juice. Fifteen-drop doses of brandy were given from May the 10th to June the 6th.

The child continued to attend the hospital as an out-patient. When discharged from the hospital, according to the mother's statement, she noticed nothing, and used to grope for things with her hands. She took no notice of a lamp or other bright light, and was considered to be altogether blind. As an out-patient she was ordered small doses of the compound syrup of phosphate of iron. On July the 4th—that is, nineteen days after she left the hospital and thirty-five days after she lost her sight—a note was made to the effect that "she begins to see." She commenced by noticing the presence of milk and other food, and the sight is said to have improved gradually until on August the 15th she could see just as well as other children. Martha F— was again seen by me on October the 9th, 1901, or about five months after her illness began. She was then a little over two years of age. She seemed to possess very good sight, and was said by her mother to be able to pick up pins from the floor. The child was in good general condition, of normal intelligence, and not deaf. The pupils were equal and responsive to light. When the fundi oculorum were examined a week later (October the 16th), the optic discs were found to be of good colour and the retinal vessels of normal calibre.

The foregoing cases of fleeting amaurosis must be carefully distinguished from a closely allied variety, where a child recovers from an attack of meningitis with impaired sight due to an incomplete atrophy of the optic papilla. There may, besides, be a paresis of one or more of the extrinsic muscles of the eyeball, generally, in my experience, of one of the muscles supplied by the third cranial nerve. My meaning may perhaps be rendered clearer if one or two illustrative cases be briefly quoted.

Case 5.—Albert H—, aged 7 years, was first seen on February the 21st, 1893. He was bad-tempered and

feeble-minded, and his speech was difficult to understand. Slight nystagmus was present. The sight was obviously defective, but he was certainly able to count fingers at a distance of twenty feet. Both optic discs were incompletely atrophic. Upon inquiry, I ascertained that about three years before he came under my notice, he complained of headache, lost the power of walking, and developed a marked tendency to vomit; his head was held stiff, the left eye squinted inwards, and there was a discharge from the right ear. The last note I have about Albert H— refers to July the 18th, 1898, when sight in the right eye was equal to about one-half of the normal and in the left eye to about one-fifth of the normal. Fixation was imperfect, and the left eye tended to diverge. Colour-blindness was present. The optic discs were as noted previously. What I took to be a large hæmorrhage undergoing absorption was present in the central region of the left fundus oculi.

Case 6.—Arthur John M—, aged 1 year 6 months, was sent to me by my friend Mr. C. E. Adams, of West Norwood, on January the 18th, 1894. The history was that three months before coming under my notice the child fell ill, became drowsy, and did not care for his food. The condition gradually became worse; the child suffered from pain in the head, he was convulsed five or six times a day, and his neck was stiff and his head retracted. The right eye was noticed to turn towards the nose. There was no vomiting. The sight, which was good prior to the attack, seemed to fail in the third week of the illness. The patient was the sixth child, and was born at full term after a natural labour lasting twelve hours. The illness, diagnosed by Mr. Adams as meningitis, lasted about two months and a half.

When I examined the child the patient was found to be fairly well-nourished, with all his teeth except two. The anterior fontanelle was not widely open. The right eye had a large convergent squint, apparently due to a

paralysis of the external rectus muscle. The pupils dilated readily under the influence of homatropine. The optic discs were sharply defined and somewhat white. The child retained just sight enough to move about without running into the furniture in the room.

Remarks.—Persistent and temporary blindness, then, occur in young children suffering from meningitis, the only difference being that while temporary blindness is not, symptomatic blindness is associated with permanent ophthalmoscopic changes. It seems more than probable that a single cause accounts for both forms. We know that the essential change of simple basal meningitis is an inflammation of the pia mater at the base of the brain, extending from the medulla behind to the optic chiasma in front, and due to the presence of a specific diplococcus which has been described by Still.* By matting together the cerebellar lobes the occlusive inflammation leads to closure of the foramen of Magendie, and so impedes the circulation of the cerebro-spinal fluid. The third ventricle thus becomes distended, and if the process continues may eventually press upon the optic chiasma. The pressure, if it last long enough, may readily set up a descending neuritis,† followed by atrophy, of the optic nerve and some degree of permanent blindness. This would account for the cases of slight but permanent amblyopia spoken of above.

If from any cause, however, the adhesions happened to give way early enough, the consequence would appear to be twofold: firstly, relief to the meningitic symptoms; and secondly, restoration of vision before the onset of atrophic changes in the optic nerve. This seems to be a reasonable view to account for the temporary amaurosis described in the present communication. It is scarcely conceivable that two processes so closely allied should

* Still, 'Journ. Path. and Bact.,' May, 1898.

† Optic neuritis is sometimes, although rarely, seen during the course of a simple basal meningitis.

not be due to a common cause, which cause I cannot but believe to be other than that of pressure by the distended third ventricle (infundibulum) upon the optic chiasma. The dilatation of the pupil, so often noted in cases of temporary amaurosis, is a further argument in favour of an organic origin for the blindness. The ocular nerves, the third, the fourth, and the sixth, especially the former two, may suffer either by the direct pressure of the distended ventricle, or by becoming involved in the inflammatory exudation at the base of the brain. This would, of course, account for the implication of the ocular muscles, as mentioned in Cases Nos. 3, 5, and 6 in the list. If the block in the circulation of the cerebro-spinal fluid be not relieved, blindness ensues, and the child eventually succumbs to the disease. Recurrence of obstruction indicates relapse of inflammation and also of amaurosis, as in Cases Nos. 2 and 3 just narrated. A similar train of reasoning would explain the amblyopia, persistent or temporary, as met with in cases of meningitis other than the simple basal variety.

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